

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for searching holograms to determine the address of a target data page recorded in a holographic recording medium, the method comprising the steps of:

emitting a signal beam;

modulating the signal beam, by a spatial light modulator, using a search data page having a plurality of equally divided data blocks, at least one of the data blocks of the search data page consisting of an encoded search image;

irradiating the modulated signal beam onto ~~a~~ the holographic recording medium having digital information encoded in a plurality of data pages multiplexedly recorded thereon in a plurality of data pages, thereon, each data page having a plurality of equally divided data blocks ~~and being multiplexed blocks,~~ to transmit ~~a one or more diffracted beam when irradiated by a light beam; beams;~~

receiving the one or more diffracted beams emitted from the holographic recording medium in response to the modulated signal beam;

detecting a target diffracted beam having a maximum intensity of the one or more diffracted beams; and

determining an address of the target diffracted beam as the address of a target data page that comprises an encoded target data image matching the encoded search image,

wherein ~~a data image is formed within each data block of the recorded data pages~~ have data blocks comprising data images encoded by an encoding method that provides a certain same number of ON pixels.

2. (Previously Presented) The method according to claim 1,

wherein all pixels in the data blocks of the search data page other than the at least one search data block are OFF pixels.

3. (Previously Presented) The method according to claim 1,
wherein one data block of each data page in the holographic recording medium is a dedicated search data block having a larger number of ON pixels than the other data blocks of the data page.

4. (Previously Presented) The method according to claim 2,
wherein one data block in each data page in the holographic recording medium is a dedicated search data block having a larger number of ON pixels than the other data blocks of the data page.

5. (Previously Presented) The method according to claim 1, further comprising:
adjusting a beam diameter and an optical path of the signal beam such that the signal beam passes substantially only through the at least one search data block displayed on the spatial light modulator.

6. (Currently Amended) The method according to claim 1,
wherein the encoded ~~data~~-search image to be retrieved is sequentially displayed on the at least one of the data blocks of the search data page in the spatial light modulator.

7. (Previously Presented) The method according to claim 2,
wherein the encoded search image is sequentially displayed on the at least one of the data blocks in the search data page of the spatial light modulator.

8. (Previously Presented) The method according to claim 1,
wherein the encoded search image is displayed at the same time in all of the data blocks in the search data page used by the spatial light modulator.

9. (Currently Amended) A method for searching holograms to determine the address of a target data page recorded in a holographic recording medium, the method

comprising the steps of:

generating a signal beam;

modulating the signal beam by a spatial light modulator using a search data page

having a plurality of equally sized data blocks, a same search image being encoded into each data block of the search data page;

irradiating the modulated signal beam onto ~~a~~the holographic recording medium having digital information encoded in a plurality of data pages multiplexedly recorded thereon ~~in data pages, each data page being multiplexed~~ to transmit ~~a~~one or more diffracted beam ~~when irradiated by a light beam, beams,~~ each recorded data page comprising a plurality of equally divided data blocks;

receiving the one or more diffracted beams emitted from the holographic recording medium;

detecting a target diffracted beam having a maximum intensity of the one or more diffracted beams; and

determining an address of the target diffracted beam as an address of a target data page,

wherein each data block of the recorded data pages recorded in the holographic recording medium contains a data image formed by an encoding method that provides a different number of ON pixels for each data block.

10. (Previously Presented) The method according to claim 1, further comprising:
generating a reproduction reference beam to retrieve the target data page; and
irradiating the holographic recording medium by the reproduction reference beam to reproduce the target data page.

11-12. (Canceled)

13. (Previously Presented) The method according to claim 8, further comprising:

generating a reproduction reference beam to retrieve the target data page; and
irradiating the holographic recording medium by the reproduction reference beam to reproduce the target data page.

14. (Previously Presented) The method according to claim 9, further comprising:
generating a reproduction reference beam to retrieve the target data page; and
irradiating the holographic recording medium by the reproduction reference beam to reproduce the target data page.

15. (Currently Amended) A holographic recording and reproducing apparatus comprising:

an object optical system that directs an object beam to a holographic recording medium having ~~a hologram~~ holograms recorded thereon, the ~~hologram~~ holograms comprising a plurality of multiplexedly recorded data pages each storing encoded digital information, each data page being separately retrievable;

a reference optical system that directs a reference beam to the holographic recording medium;

a spatial light modulator provided in the object optical system that displays a search data page including a plurality of data blocks, the data blocks of the search data page being equally sized with each other, the spatial light modulator encoding search information into at least one data block of the search data page, the object optical system modulating the object beam by the search data page having the encoded search information;

a search imaging device for receiving a plurality of diffracted beams produced by the holographic recording medium when the holographic recording medium is irradiated with the modulated object beam output from the object optical system;

a signal processing circuit for processing an output signal from the search imaging device, and that identifies an address of a target data page containing the encoded search

information as an address corresponding to a diffracted beam having a maximum intensity of the plurality of diffracted beams; and

a reproduction imaging device for receiving a diffracted beam produced by the holographic recording medium in response to irradiation with a reproduction reference beam having the determined address from the reference optical system and for reproducing the digital information of the target data page retrieved by the diffracted beam.

16. (Previously Presented) The holographic recording and reproducing apparatus according to claim 15,

wherein the spatial light modulator is configured such that all pixels in the data blocks of the search data page other than the at least one data block of the search data page in which the search information is displayed are OFF pixels.

17. (Currently Amended) The holographic recording and reproducing apparatus according to claim 15,

wherein the spatial light modulator employs one of the data blocks in each search data page as a dedicated search data block, and,

for each search data page, the dedicated search data block comprises a data image having a larger number of ON pixels than any data images in the other data blocks of the data page.

18. (Currently Amended) The holographic recording and reproducing apparatus according to claim 16,

wherein the spatial light modulator employs one of the data blocks in each search data page as a dedicated search data block, and,

for each search data page, the dedicated search data block comprises a data image having a larger number of ON pixels than any data images in the other data blocks of the data page.

19. (Currently Amended) The holographic recording and reproducing apparatus according to claim 15,

wherein the object optical system is configured such that a beam diameter and an optical path of the ~~signal-object~~ beam can be adjusted so that the ~~signal-object~~ beam passes substantially only through the at least one search data block displayed on the spatial modulator.

20. (Previously Presented) The holographic recording and reproducing apparatus according to claim 15,

wherein the spatial light modulator is configured such that the search information can be sequentially displayed on the plurality of data blocks of the search data page.

21. (Canceled)

22. (Previously Presented) The holographic recording and reproducing apparatus according to claim 15, wherein:

the spatial light modulator is configured such that the search information can be displayed at the same time in all of the data blocks in the search data page of the spatial light modulator.

23. (Currently Amended) A holographic recording and reproducing apparatus comprising:

an object optical system that directs an object beam to a holographic recording medium having ~~a hologram~~ holograms recorded ~~thereon;~~ thereon, the holograms comprising a plurality of multiplexedly recorded data pages each storing encoded digital information, each data page being separately retrievable;

a reference optical system that directs a reference beam to the holographic recording medium;

a spatial light modulator provided in the object optical system that displays to-be-

recorded digital information as a to-be-recorded data image in at least one of a plurality of data blocks of a search data page, the data blocks being equally sized with each other, wherein the object optical system modulates the object beam by the to-be-recorded digital information;

a search imaging device for receiving a plurality of diffracted beams produced by the holographic recording medium when the holographic recording medium is irradiated with the modulated object beam output from the object optical system;

a signal processing circuit for processing an output signal from the search imaging device, and for identifying an address of a target data block and a target data page corresponding to the diffracted beam having a maximum intensity of the plurality of diffracted beams; and

a reproduction imaging device for receiving a diffracted beam produced at the time of irradiation with a reproduction reference beam having the identified address from the reference optical ~~system,~~ system and for reproducing the digital information of the target data page retrieved by the diffracted beam,

wherein the spatial light modulator encodes the to-be-recorded data image by an encoding method to generate the to-be-recorded digital information, the encoding method provides a different number of ON pixels for each data block of a search data page.